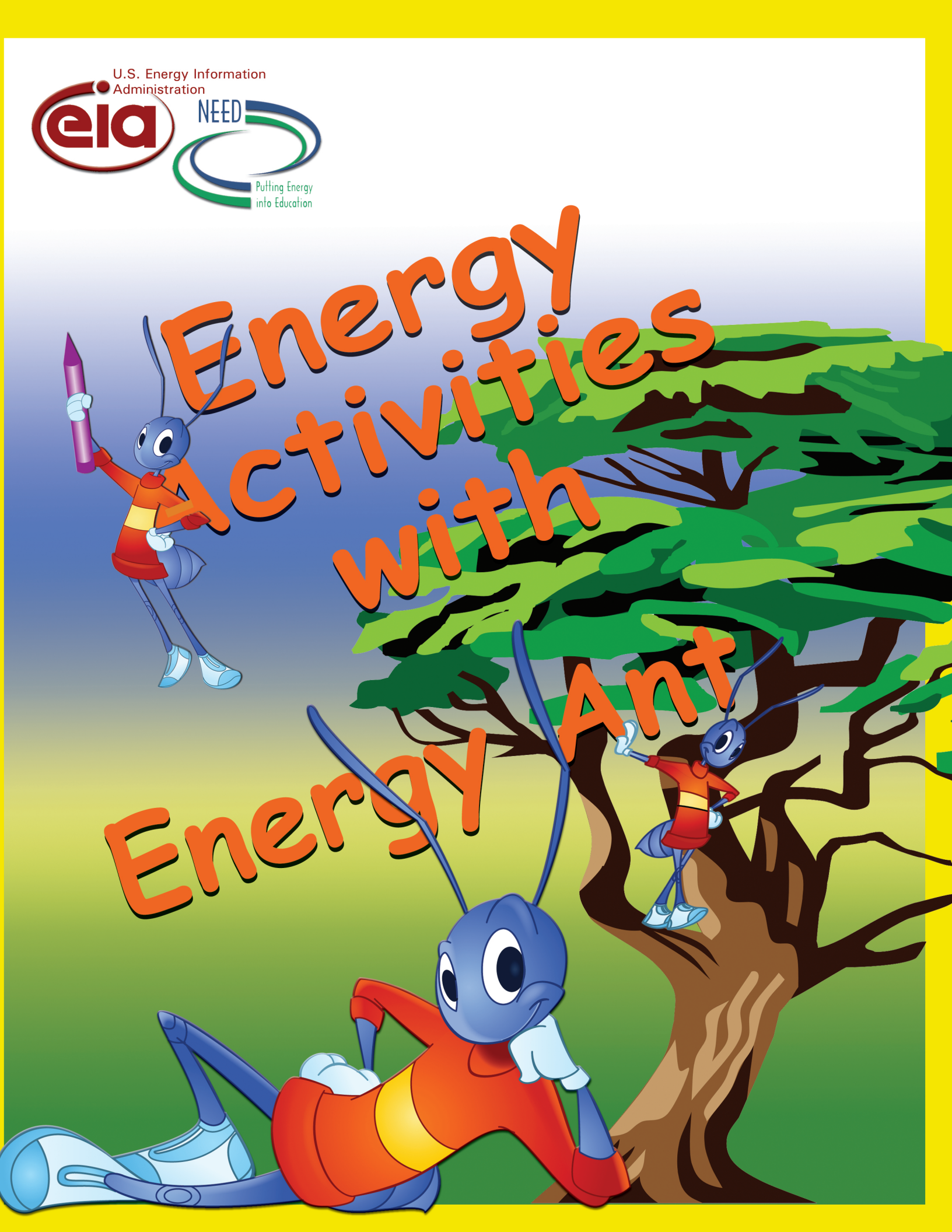
U.S. Energy Information Administration

NEED Putting Energy into Education

Energy Activities with Energy Ant



Energy Activities with Energy Ant

Energy Ant® is the host of the Energy Kids website
http://www.eia.gov/kids
The Energy Ant is a service mark of the
U.S. Department of Energy

The *Energy Activities with Energy Ant* booklet is a collaborative project developed by the U.S. Energy Information Administration (EIA) and the National Energy Education Development (NEED) Project.

I'm full of Energy!
ENERGY CAN BE FUN!
SM

ENERGY ACTIVITY:

Motion

Make a circle around the objects that burn fuel to move.

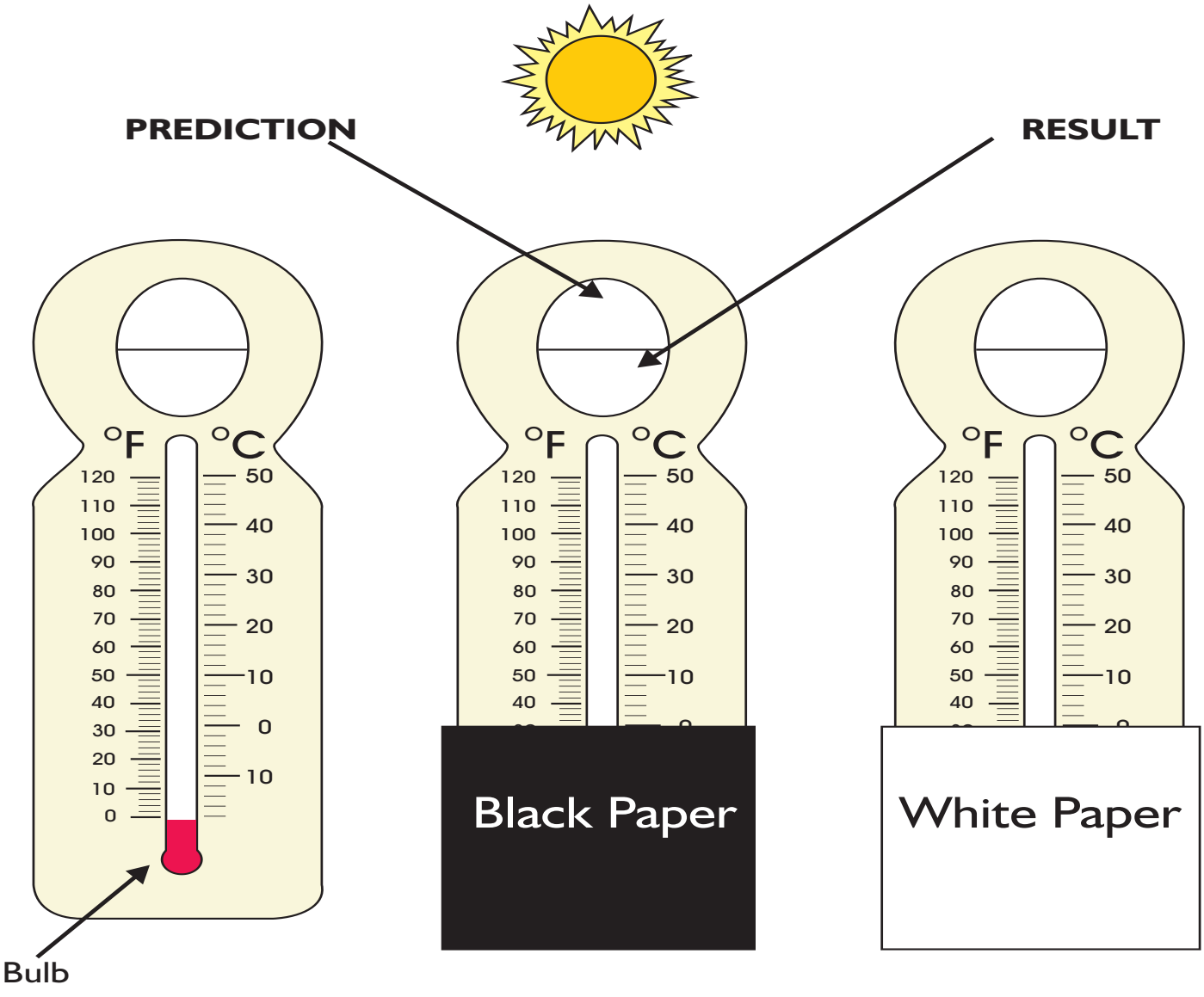
Make an “X” through the objects that need people power to move.

ENERGY ACTIVITY: *Energy from the Sun*

When solar energy hits objects, some of the energy is reflected and some is absorbed and changed into heat. Some colors absorb more solar energy than others.

Step 1. Put three thermometers in a sunny place.
Step 2. Cover the bulb of one with black paper. Cover the bulb of one with white paper.
Step 3. Predict which thermometer will get the hottest. Number them 1-3, with one as the hottest.
Step 4. Wait a few minutes.
Step 5. Record your results by coloring the tubes of the thermometers.
Step 6. Look at the results and number the thermometers 1-3 with one as the hottest.

How Well Did You Predict?



The Tale of Fern Fossil

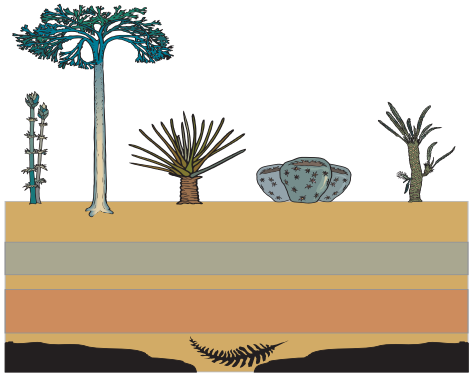
Once upon a time, a beautiful fern tree grew in a swamp. All day, she soaked up sunlight and stored it in her fronds. The sun's energy helped her grow tall.

The biggest frond was Fern Fossil. Every day she stretched closer to the sun. She was proud to be the tallest frond on the tree.

One day, the sky grew dark and a strong wind blew. The other fronds huddled together. They gave each other strength. But Fern was too high. She was all alone. There were no fronds tall enough to help her.

The wind blew harder and Fern's stem snapped. She fell from the tree into the dark water. Fern sank to the bottom of the swamp. She thought her journey was over.

Nature had a different plan for Fern. For a long time, she lay in the swamp. More plants fell into the water. They covered Fern like a blanket.



After many years, the water dried up and the swamp turned into land. Dinosaurs roamed over the earth. Fern lay under the ground, buried deeper and deeper.

The weight of the dirt and the heat of the earth changed Fern. She was no longer green. She lost her leafy shape. But she still had the sun's energy stored in her.

Fern Fossil had turned into a shiny black rock full of energy. She was a piece of coal. Fern and many other plants were now a big seam of coal buried under the ground.

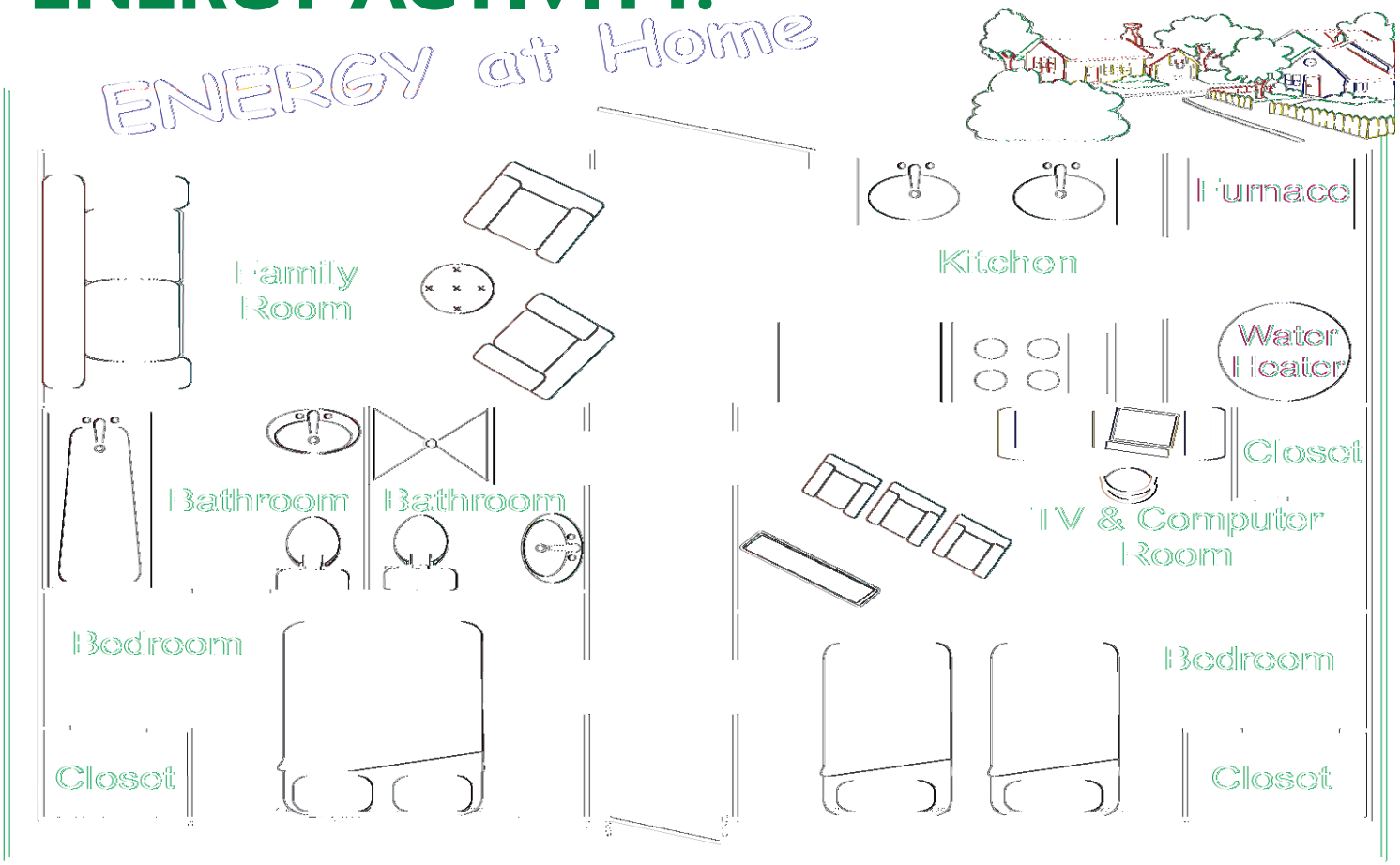
One day, a big machine dug into the earth. It took away the dirt on top of the coal. It lifted Fern from the earth and put her into a huge truck. She was taken to a building where she was washed, then put on a train.

The train chugged through the night to a power plant. Fern was put into a boiler and burned. Her energy produced a lot of heat.

The power plant used Fern's energy to make electricity. It traveled through a power line to a house. A little boy turned on a light so that he could read.

The energy that Fern had gotten from the sun millions of years ago was lighting the night. Fern had traveled a long way.

ENERGY ACTIVITY:



1. How many live in this house (count the pillows on the beds)? _____

2. Each bathroom has two . How many are in all the bathrooms? _____

3. Each bedroom has two and each closet has one . How many in all? _____

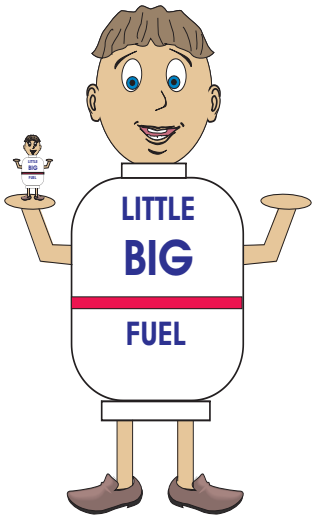
4. The family room, kitchen, utility room, hall and TV/computer room each have one . How many are there in the whole house? _____

5. Each uses one for four hours each day. How many hours a day are they used in all? _____

6. Each uses ten cents ($0.10) worth of electricity per hour. How much does the family pay for electricity for every day? _____

7. Two take showers every day and two take baths. Each shower uses 10 gallons of and each bath uses 20 gallons.The family also uses 20 gallons of a day to wash dishes. How many gallons of are used each day? _____

The Tale of Little Big Fuel



My name is Little Big Fuel. It's a strange name, I know. Lots of people think I'm strange. I think I'm magical. This is my story.

I've been underground for millions of years. No one knew I was there. I'm invisible, you can't see me. You can't smell me. You can't feel me either; I'm a gas. I hide in rocks with petroleum and natural gas.

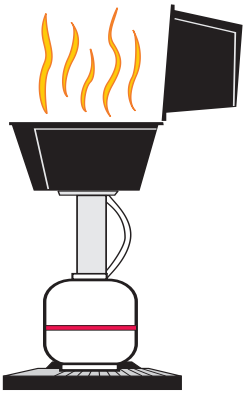
Ninety years ago, Dr. Snelling found me. He named me propane, but my friends call me Little Big Fuel. Here's the reason why.

When everything is normal, I'm a gas. You can't see me, but I'm full of energy. You can burn me to make heat.

I can heat your house. I can cook your food. I can run lanterns and tractors. I can help make things you use everyday. I can run big machines inside buildings because I'm so clean. I can even take you for a ride in a hot air balloon.

All these things I do are very good. But they aren't the thing that makes me special. This is my secret: you can turn me into a liquid and make me very, very small. If you squeeze me – compress me – I'll turn into a liquid.

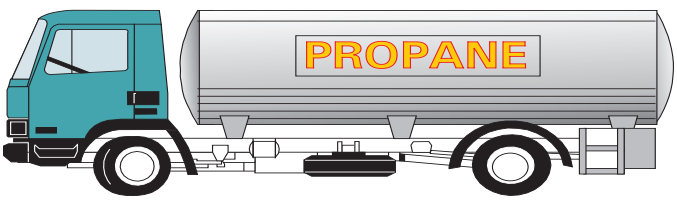
See the big picture of me? That's my size as a gas. The little guy is my size as a liquid. I'm 270 times smaller! I still have the same number of molecules and the same amount of energy. I'm just squeezed together.

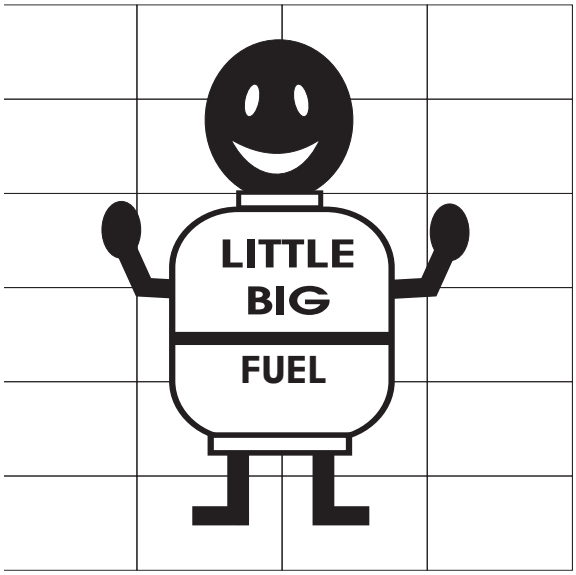


People squeeze me into small bottles so they can carry me with them. They take me camping to cook their food and light their lanterns. People put me into tanks on their barbecue grills.

Farmers fill big tanks with me as a liquid. I can heat their barns and houses for a long time. Big trucks take me to farms to fill the tanks. When I leave the tanks, I'm not under pressure anymore. I turn into a gas again and get big; I expand. Then I am burned to make heat.

That's why I'm called Little Big Fuel. I am amazing, don't you think?





ENERGY ACTIVITY:

Practicing Drawing to Scale

Using the larger sheet of graph paper, below, please draw the picture of "Little Big Fuel" that is on the smaller sheet of graph paper, to your left.

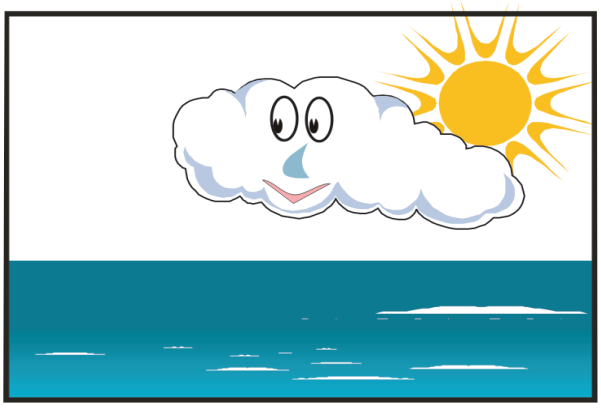
The Tale of Annie Soakley

I'm Annie Soakley. I am a world traveler. Let me tell you about my last trip. It began in the Pacific Ocean. I was floating in the waves with my friends. We were bobbing up and down, watching the sun rise over the mountains. What a beautiful sight!

The sun climbed higher in the sky. I began to get warm. I got warmer and warmer. Suddenly, I rose out of the water. I floated toward the sky. I grew bigger and bigger. My molecules got farther and farther apart. I expanded.

I didn't look like a drop of water anymore. I was invisible. I had turned into water vapor. I had evaporated! I rose high into the sky. Many of my friends came with me. They had evaporated, too. Together, we formed a cloud.

The wind pushed us through the sky. We sailed over the ocean toward land. The people on the beach were sad to see us. We blocked the sun.



We passed over them and headed for the mountains. The wind kept pushing us. We reached the mountains as the sun set. The air on top of the mountains was cold. It made me cold. As I cooled, I grew smaller. My molecules got closer together. I turned into a drop of water again. I condensed.

I was too heavy for the cloud to hold me. I began falling toward the earth. I was a rain drop! My friends condensed, too. The weatherperson on TV called us precipitation, which is water falling to earth.

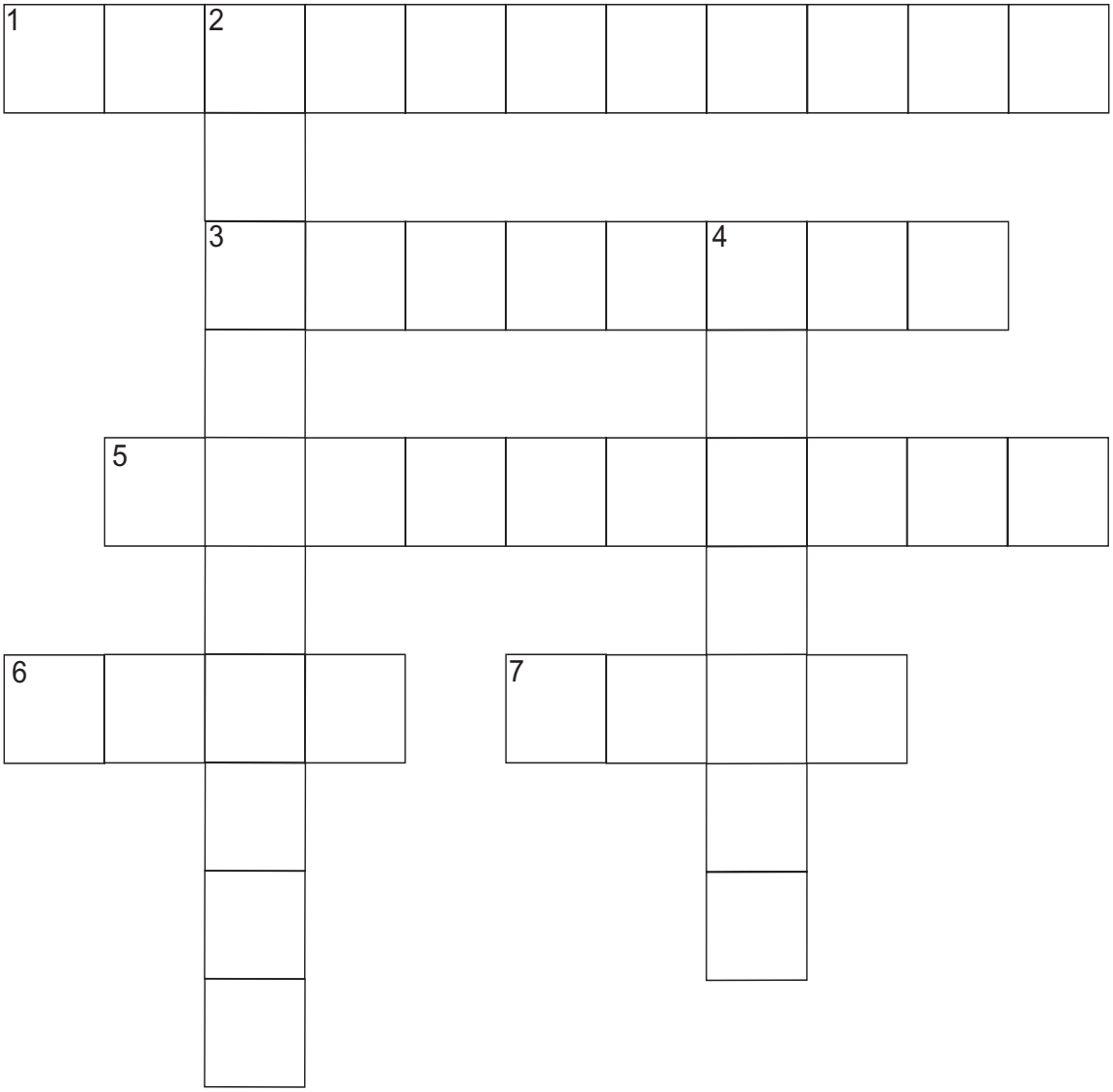
We fell into a small creek and began flowing down the mountain. The creek flowed into a mighty river. Gravity was pulling us down the mountain. We were moving very fast. We had a lot of energy.

Suddenly, we found ourselves in a long tunnel. A machine called a turbine was at the end of the tunnel. We rushed through the turbine, making it spin. The turbine used our energy to make electricity.

We flowed back into the river. The river made its way through farms and towns until it reached the ocean. I floated out into the waves, glad to be home again. It had been an exciting trip through the water cycle.

ENERGY ACTIVITY:

Energy Word Puzzle



ACROSS

1 This powers our light bulbs.

3 A form of transportation that burns fuel to move. (Hint: It flies.)

5 Propane turns into a liquid after this has been done to it.

6 A black rock full of energy.

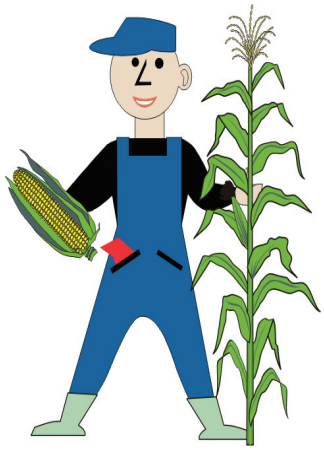
7 In the U.S., ethanol is made from what plant?

DOWN

2 When a drop of water becomes invisible, it does this.

4 The color black does this to solar energy.

The Tale of Johnny Energy Seed

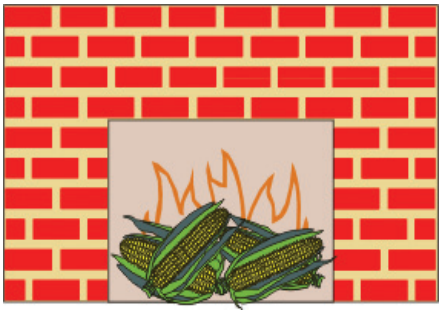


I'm Johnny Energy Seed. I plant energy seeds in a big field on my farm.

The sun shines. There is energy in the sun's rays. It helps my seeds grow into tall plants. My plants store the sun's energy in their roots, stalks, leaves and ears. Soon my energy plants look like this.

I can use the energy in my plants for many things. I can eat the seeds for energy for my body. This energy will help me grow and move and think.

I can feed my energy plants to my chickens, pigs, cows and horses. The energy will make my animals grow big and strong.



I can hang my energy plants in my barn to dry. Then I can burn them in my fireplace. The energy in my plants can keep me warm on cold winter nights.

I can put my energy plants into a big container that keeps out the air. As my plants decay, they can make a gas that I can burn in my stove to cook my food.

I can also turn my energy plants into fuel for my tractor. I turn them into alcohol, like grapes are turned into wine. This alcohol fuel, called ethanol, can run my tractor.

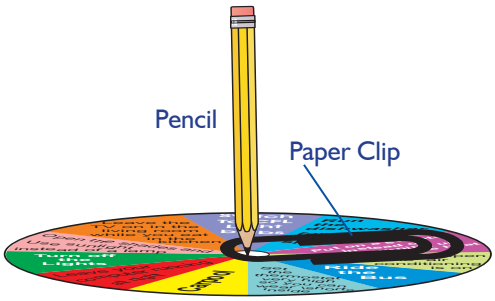
As you can see, a seed of corn really is an energy seed. Why don't you plant some corn seeds and explore the ways you can use the energy in the plants you grow.

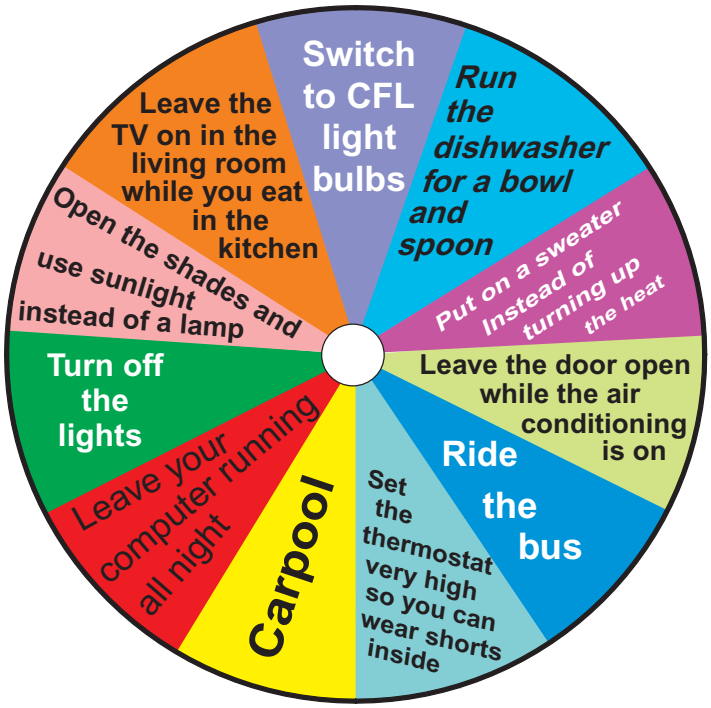
The next page has an energy game. The spinner wheel can be cut out of this booklet. Follow instructions for placing a paper clip on the point of a pencil and placing the point of the pencil (with the paper clip) in the center of the small white circle in the middle of the spinner wheel.

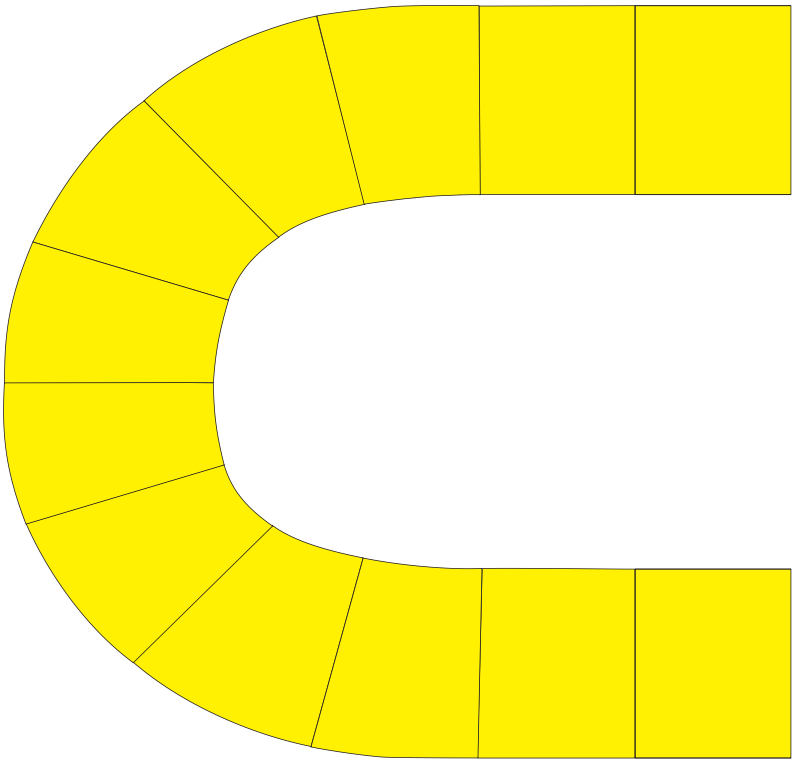
END

Used the window to look inside the oven instead of opening it. SPIN AGAIN

This is the spinner for this board game. Please cut out spinner from this booklet. Place a paper clip on the point of a pencil and place the point of the pencil (with the paper clip) in the small white circle in the middle of the spinner. Fling the paper clip around. It spins really well. When the paper clip stops spinning, it will land on one of the sections of the spinner. Read the comment and act, accordingly.







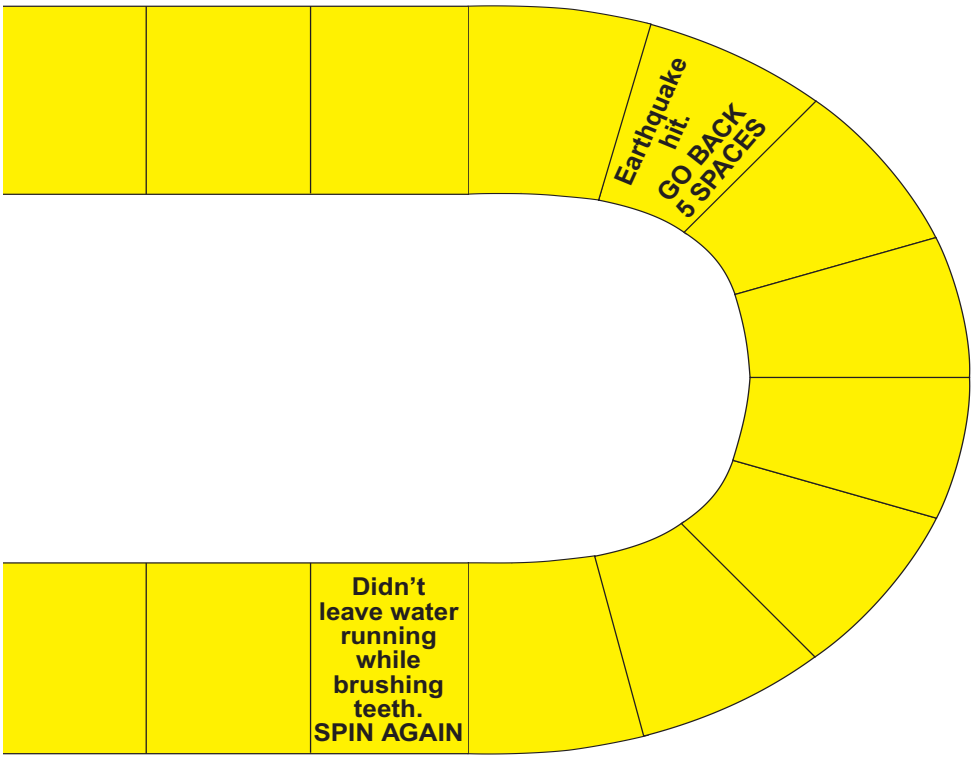
RULES: The oldest person goes first. Everyone should have a paper clip, eraser, a piece of paper with their name on it or something else small to use as their playing piece.

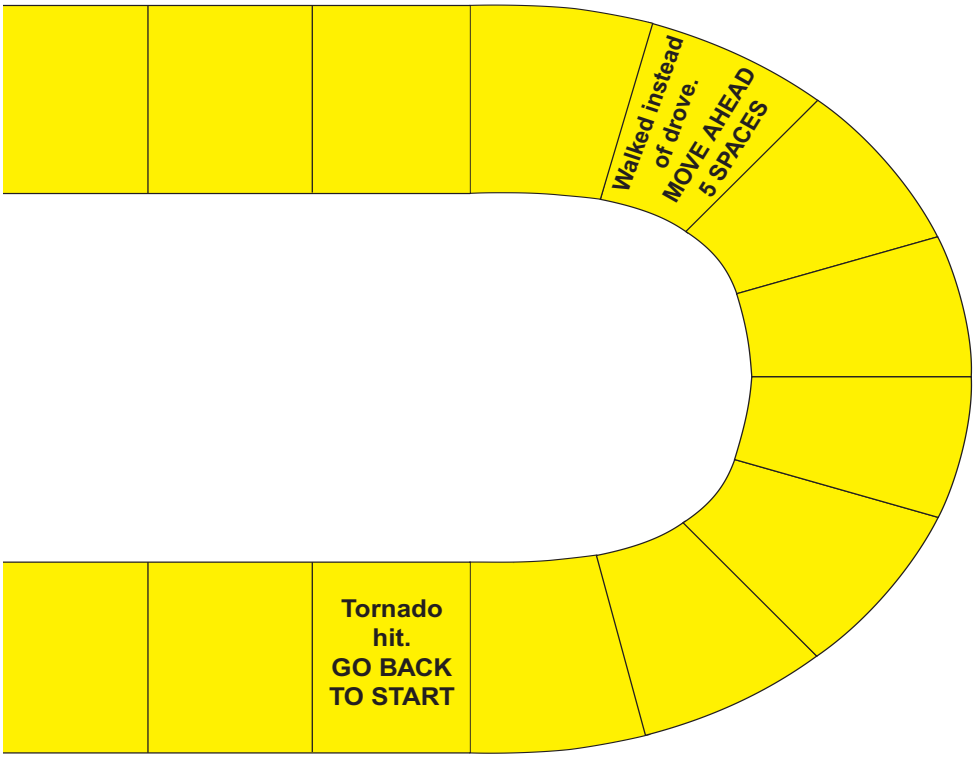
Now, spin.

- If the paper clip dial lands on a conservation tip, move forward two spaces.
- If the paper clip dial lands on something that uses energy, move back one space.

The first player to come to the end wins the game.

START


Earthquake hit. GO BACK 5 SPACES
Didn't leave water running while brushing teeth. SPIN AGAIN


Walked instead of drove. MOVE AHEAD 5 SPACES
Tornado hit. GO BACK TO START

Visit The U.S. Energy Information Administration's Energy Kids website at:

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www.need.org